

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of manufacturing a semiconductor device, the method of comprising:

forming a wafer containing ~~inlaid~~ copper (Cu) or a Cu alloy filling an opening formed in a dielectric layer; and

laser thermal annealing an exposed surface of the Cu or Cu alloy to remove oxide therefrom.

2. (Currently Amended) ~~The method according to claim 1, comprising A method of manufacturing a semiconductor device, the method of comprising:~~

forming a wafer containing inlaid copper (Cu) or a Cu alloy; and

laser thermal annealing in ammonia (NH₃) or hydrogen (H₂) an exposed surface of the Cu or Cu alloy to remove oxide therefrom.

3. (Original) The method according to claim 2, comprising laser thermal annealing in NH₃ at an NH₃ flow of about 200 to about 2,000 sccm.

4. (Original) The method according to claim 2, comprising laser thermal annealing in H₂ at an H₂ flow rate of about 200 to about 2,000 sccm.

5. (Original) The method according to claim 2, comprising laser thermal annealing at a temperature of about 370°C to about 420°C.

6. (Original) The method according to claim 5, comprising laser thermal annealing by impinging a pulsed laser light beam on the exposed surface at a radiant fluence of about 0.09 to about 0.11 joules/cm².

7. (Original) The method according to claim 5, comprising laser thermal annealing for about 10 to about 100 nanoseconds.

8. (Original) The method according to claim 1, comprising laser thermal annealing at a temperature of about 370°C to about 420°C.

9. (Original) The method according to claim 8, comprising laser thermal annealing for about 10 to about 100 nanoseconds.

10. (Currently Amended) ~~The method according to claim 1, further comprising~~

A method of manufacturing a semiconductor device, the method of comprising:

forming a wafer containing inlaid copper (Cu) or a Cu alloy;

laser thermal annealing an exposed surface of the Cu or Cu alloy to remove oxide

therefrom; and

depositing a silicon nitride capping layer on the treated Cu surface.

11. (Original) The method according to claim 10, comprising depositing the silicon nitride capping layer by plasma enhanced chemical vapor deposition (PECVD).

12. (Original) The method according to claim 11, comprising depositing the silicon nitride capping layer at a thickness of about 450 Å to about 550 Å.
13. (Original) The method according to claim 1, wherein the wafer contains a dual damascene structure comprising a Cu or Cu alloy line in contact with an underlying Cu or Cu alloy via formed in a dielectric layer.
14. (Original) The method according to claim 13, wherein the dielectric layer comprises a material having dielectric constant less than about 3.9.